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**PNEUMATICALLY ACTUATED HANDHELD STRAPPER**

**TITAN Umreifungstechnik GmbH**

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PNEUMATICALLY ACTUATED HANDHELD STRAPPER

[Pneumatishch betätigbares Umreifungshandgerät]

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| Grantee: | TITAN Umreifungstechnik GmbH & Co. KG |
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The invention pertains to a pneumatically actuated handheld strapper with a housing, a pneumatic actuating drive, a pneumatically actuated tensioner and fastener for tensioning and fastening the band-like strap, a handle that protrudes from the housing and contains a grip that is rigidly connected to the housing, as well as a holder for a balancer that serves for ergonomically and movably holding the handheld device, wherein a coupler for connecting a compressed air line is provided on the device, and wherein the handle is held on the housing such that it can be pivoted to a limited degree together with the pneumatic actuating drive and with parts of the tensioner and/or fastener.

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Strappers of this type are used for strapping packages with a steel band. These handheld devices are suspended on a so-called balancer in order to ergonomically position the devices and to ensure that the user is able to easily manipulate and move the device. The balancer consists, for example, of a steel cable or the like with an equilibrium-type hoisting mechanism. The end of this cable is secured in a holder such that the user is able to position the device at any height above the ground and the device remains in the desired position. When the device is needed, the user can easily take hold of and arbitrarily move the device with one hand. Such strappers

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contain a handle with a grip and actuating switches, wherein the handle is used for holding and manipulating the entire device. Certain functions of the actuating drive can be activated by operating control switches that lie within reach of the user. The actuating drive not only makes it possible to operate the tensioner for tensioning the inserted strap, but also to actuate the fastener for interconnecting the overlapping strap ends. It must be possible to slightly pivot the handle relative to the housing, in particular, in order to open and close the tensioner. This is the reason that the handle is held such that it can be pivoted relative to the housing. Since the pneumatic actuating drive is also arranged in sections of the device that form part of the handle, it is known from the state of the art to arrange the coupler for connecting the compressed air line that serves for operating the pneumatic actuating drive on the handle, particularly on the free end thereof. However, this arrangement is unfavorable in several respects, namely because the hose of the compressed air line to be connected to the coupler interferes with the operation of the device. In conventionally designed strappers, it is also necessary to provide a connecting line for coupling the pneumatic actuating drive with a valve block that is arranged within the housing and can be actuated by means of control switches arranged on the housing. This is usually realized with a hose-like connection that also impairs the function. In addition, such hose-like connections are sensitive to ruptures.

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Based on this state of the art, the invention aims to develop a strapper of the initially cited type that can be operated in a more convenient and more reliable fashion.

This objective is attained in that the coupler is arranged on and protrudes from the housing side, on which a holding eyelet of the holder for the balancer is arranged, namely such that the axis of the coupler extends about parallel to the direction in which the force of the balancer is applied, in that the coupler is connected to a valve block of a pneumatic actuating drive inside the housing, and in that the pneumatic actuating drive is connected to the valve block by means of a tubular rotary leadthrough that is oriented coaxial to the pivoting axis of the handle, wherein said leadthrough extends into components of the handle and is connected to the valve block by means of a deflection.

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According to the invention, the coupler for connecting the compressed air line is no longer arranged on the handle, but rather on the housing itself, namely on the housing side that also contains a holding eyelet or the like for the balancer. This means that the compressed air line may extend parallel to the balancer that is suspended, for example, from the ceiling of the building or a frame arranged above the workstation, wherein the compressed air line is arranged parallel to the balancer such that it does not obstruct the user during the manipulation of the strapper. The compressed air supplied via the coupler is then conveyed to the pneumatic actuating drive arranged in the pivotable handle section via the valve block provided inside the housing. A tubular rotary leadthrough is provided for producing the connection between the

valve block and the pneumatic actuating drive, wherein one side of this rotary leadthrough is rigidly connected to the valve block arranged in the housing and its other side forms a rotatable inlet into the handle, and wherein this connection with the handle is oriented coaxial to the pivoting axis thereof. This ensures a high operational reliability and an undisturbed delivery of compressed air to the pneumatic actuating drive, namely without restricting the operating convenience for the user. /6

The invention proposes, in particular, to realize the rotary leadthrough with its deflection in the form of a tubular molded part that has the shape of a U, wherein the first limb of this molded part forms the rotary leadthrough and the second limb is connected to the valve block in the housing.

In this embodiment, it is preferred to insert an externally manipulated throttle screw into the second limb.

This limb may consist, for example, of a banjo bolt that leads into the valve block on its open end, wherein a throttle screw for controlling the throughput of compressed air is inserted into the opposite end relative to the valve block. /7

The invention is described below with reference to one embodiment. The figures show:

Figures 1-5, different aspects of a pneumatically actuated strapper according to the invention, and

Figure 6, a section through the device along the line VI-VI in Figure 5.

The figures show a pneumatically actuated handheld strapper for strapping packages with a steel band. The handheld device comprises a housing 1, on which a holder 2 for a balancer is arranged. This balancer holds the handheld device in an economically favorable and movable fashion. The end of the cable-like balancer is secured in the eyelet 3 of the holder 2, wherein the balancer is realized in the form of an equilibrium-type hoisting mechanism that is mounted on the ceiling of the building or a frame arranged above the workstation. The balancer acts in the direction indicated by the reference symbol 4. A handle 5 protrudes from and is held in a pivoted fashion on the housing 1. A rigid grip 6 is arranged in the holding region of the handle 7, wherein the handle 5 can be pivoted against said grip. The reference symbol 7 identifies the pivoting axis, about which the handle 5 can be pivoted relative to the housing to a limited degree. A fastener 8 that can be actuated by means of the pneumatic actuating drive described below is rigidly connected to the housing. A section of a tensioner 9 that serves for tensioning the band-like strap is also rigidly connected to the housing. Another section of the tensioner 9 forms part of the handle 5 and can be pivoted together with the handle, namely such that the tensioner 9 can be opened and closed by actuating and pivoting the handle 5 from the position shown in Figures 1 and 2 into the position shown in Figures 3 and 4. /8

Figure 6, in particular, shows quite clearly that the pneumatic actuating drive 10 also forms part of the pivoted handle 5.

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A coupler 11 is provided on the upper side of the housing 1 in order to connect a compressed air line to the pneumatic system of the device, wherein this coupler is oriented parallel to the direction 4 in which the force of the balancer is applied. This means that the compressed air line connected to the coupler 11 can be aligned and installed parallel to the direction 4 in which the force of the balancer is applied, and that the user is not obstructed while manipulating the device. An open connection is produced between the coupler 11 and a valve block 12 that is arranged and mounted within the housing 1. The compressed air is delivered to the valve block 12 via the coupler 11 and then from the valve block to the pneumatic actuating drive 10, namely by actuating the control switches 13, 14 arranged on the housing. A line connects the valve block 12 to the pneumatic actuating drive 10. For this purpose, a tubular rotary leadthrough 15 is connected to the pneumatic actuating drive, wherein this rotary leadthrough is oriented coaxial to the pivoting axis 7 of the handle 5 and rotatively extends into corresponding components of the handle 5. A line connects the rotary leadthrough to the valve block 12 via a deflection 16, wherein the deflection and the rotary leadthrough are realized in the form of dimensionally stable elements. The rotary leadthrough with its deflection 16 is realized, in particular, in the form of a tubular molded part that has the shape of a U and, if so required, may consist of several parts, wherein the first limb forms the rotary leadthrough 15 and the second limb is connected to the valve block 12 in the housing. The second limb consists of a banjo bolt that is screwed into the valve block 12, wherein a throttle screw 17 is inserted into the second limb in order to adjust the throughput of compressed air.

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The invention provides a very compact strapper that has a user-friendly design and is not sensitive to wear.

The invention is not limited to the described embodiment and allows numerous variations without deviating from the scope of disclosure.

All innovative characteristics and combinations of characteristics disclosed in the description and/or the figures are deemed essential to the invention.

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### Claims

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1. A pneumatically actuated handheld strapper with a housing (1), a pneumatic actuating drive (10), a pneumatically actuated tensioner (9) and fastener (8) for tensioning and fastening at the band-like strap, a handle (5) that protrudes from the housing (1) and contains a grip (6) that is rigidly connected to the housing (1), as well as a holder (2) for a balancer that ergonomically and movably holds the handheld device, wherein a coupler for connecting a compressed air line is provided on the device, and wherein the handle (5) is held on the housing (1) such that it can be

pivoted to a limited degree together with the pneumatic actuating drive (10) and with parts of the tensioner (9) and/or fastener, characterized by the fact that the coupler (11) is arranged on and protrudes from the housing side, on which a holding eyelet (3) of the holder (2) for the balancer is arranged, namely such that the axis of the coupler (11) extends approximately parallel to the direction (4), in which the force of the balancer is applied, by the fact that the coupler (11) is connected to a valve block (12) of the pneumatic actuating drive (10) inside the housing, and by the fact that the pneumatic actuating drive (10) is connected to the valve block (12) by means of a tubular rotary leadthrough (15) that is oriented coaxial to the pivoting axis (7) of the handle (5), wherein said leadthrough rotatively extends into components of the handle (5) and is connected to the valve block (12) by means of a deflection (16).

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2. The handheld strapper according to Claim 1, characterized by the fact that the rotary leadthrough (15) with its deflection (16) is realized in the form of a tubular molded part that has the shape of a U, wherein the first limb forms the rotary leadthrough (15) and the second limb is connected to the valve block (12) in the housing.

3. The handheld strapper according to Claim 2, characterized by the fact that an externally manipulated throttle screw (17) is inserted into the second limb.







